



# Flame Retardant Chemicals: What You Need to Know

## What are flame retardants?

Flame Retardants are chemicals added to a number of products to meet regulatory standards for a product's ability to resist catching on fire. However, mounting evidence demonstrates that many of these chemicals are not effective at preventing fires. Furthermore, recent studies suggest that human health risks associated with flame retardants may outweigh their benefits.

## How are we exposed to flame retardants?

Flame retardant chemicals are released from everyday items that contain them and can then accumulate in house dust. Exposures are increased when foam is damaged or exposed. Flame retardant chemicals persist in the environment and accumulate in fatty tissues, which means they stay in the body for years. For these same reasons, animals may be exposed to flame retardants in the environment. Eating animal products can also be a source of exposure. All of the chemicals listed in Table 1 have been found in the bodies of both children and adults.

## What are the health risks if I am exposed?

Animal studies of exposure during the early life period suggest adverse effects on the developing brain and reproductive systems. Human studies are limited, but emerging evidence suggests that children exposed to flame retardants in utero or through breast milk may have increased risk of cognitive and behavioral problems. Some flame retardants are also suspected to cause cancer.

## Where are flame retardants found?

Flame retardant chemicals are found in many everyday items, particularly those that contain polyurethane foam. Products commonly treated with flame retardants include:

- Upholstered Furniture
- Mattresses
- Carpet padding
- Baby products (e.g. car seats, changing pads, crib mattresses)
- Electronics

## Who is most at risk from exposures?

- Children are at highest risk for exposure due to their proximity to the ground where dust settles and their hand-to-mouth behaviors. Infants in homes with a greater number of infant products (e.g. infant swings, nursery gliders, bouncer seats, changing pads etc.) have higher levels of some flame retardant chemicals in their bodies.
- Fetuses: Flame retardant chemicals have been shown to cross the placenta, and exposures during pregnancy are associated with hormonal, reproductive, cognitive, and behavioral changes in offspring in animal and human studies.
- Firefighters are at particular risk to exposures by inhalation as many building supplies and furnishings are treated with flame retardants which are released in the form of toxic smoke when they burn.

## What can I do to reduce exposure to flame retardant chemicals?

- Reduce dust by wet dusting, wet mopping and vacuuming with a HEPA filter vacuum.
- Wash hands frequently, especially before eating.
- Ventilate indoor spaces.
- Choose fibers that are naturally flame resistant such as wool.
- Avoid polyurethane foam products, particularly those with the TB117 label.
- If you purchase foam products produced after January 2015, look for the TB117-2013 label. These items no longer require flame retardant treatment of foam to fulfill regulatory standards (but use is now optional).
- Ask manufacturers and retailers if their products are flame retardant-free. Ask for it in writing.
- Replace, repair, or cover furniture with exposed foam.
- Support legislation at the local, state, and federal level to eliminate the use of toxic flame retardants.

**Table 1. Common flame retardant chemicals**

Chemical	Chemical Class	Where is it found?	What's the problem?
PBDEs (polybrominated diphenyl ethers)	Halogenated (bromine)	Banned because of toxic health effects. Still found in products made before 2005.  In some kitchen items made from plastics from recycled electronics.	Similar in chemical structure to cancer-causing PCBs and dioxins, PBDEs are persistent in the environment and bioaccumulative (accumulate in human tissue).  Associated with hormonal, reproductive, cognitive, and behavioral changes.
TDCPP (tris(1,3-dichloropropyl) phosphate and TCPP (tris (chloropropyl) phosphate); also known as chlorinated tris	Chlorinated organophosphate	Replaced PBDEs in most products. Found in polyurethane foam in furniture and baby products.  Currently the most common flame retardant chemical.	Closely related to TDBCPP, another flame retardant that was banned in children's clothing in 1977 due to its potential to cause cancer.  Causes tumors in lab animals and classified by the state of California as a known cancer causing agent.  May interfere with hormones in the body.
TBBPA (tetrabromobisphenol A)	Halogenated (bromine)	PBDE replacement found in electronics and other products.	Laboratory studies suggest that TBBPA may interfere with the immune system.  May interfere with hormones in the body.
TPHP (triphenyl phosphate)	Organophosphate	PBDE replacement found in polyurethane foam in furniture and baby products.	May interfere with hormones in the body.
Firemaster 550	A mixture that includes halogenated (bromine) and organophosphate chemicals	Replaced PBDE. Found in polyurethane foam in furniture and baby products.  Currently the second most common flame retardant chemical.	May interfere with hormones in the body.  Causes obesity, early puberty, and behavioral changes in laboratory animals.  Studies on human safety are non-existent.

## Resources

- <http://greensciencepolicy.org/>
- <http://www.chicagotribune.com/news/ct-met-flames-barriers-20120506-story.html>
- [http://www.pehsu.net/HealthProf\\_Polybrominated\\_Diphenyl\\_Ethers.html](http://www.pehsu.net/HealthProf_Polybrominated_Diphenyl_Ethers.html)
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